REMARKS

Claims 1, 3 to 11, 13 to 17, 19 to 42, 44 to 52, 54 to 97 are pending in the application, of which claims 1, 7, 11, 15, 17, 25, 26, 29, 42, 48, 52, 56, 58, 66, 67, 70, 83, 85, 89, 90, 91, 92, 93, 94, 95, 96, and 97 are independent. Favorable reconsideration and further examination are respectfully requested.

In the Office Action, claims 43 and 77 were objected to as having questionable dependency. Applicants have amended claims 43 and 77 in order to correct the dependency problem. Withdrawal of the objection is therefore respectfully requested.

Claims 42, 46 to 82, 85 to 87 and 97 were rejected under the first paragraph of 35 U.S.C. §112 for failing to comply with the enablement requirement. As shown above, Applicants have amended the claims to address the §112 rejection, i.e., clarifying the scope of the single means claim ("circuitry") to read "a memory to store executable code and a processor to execute the code." Accordingly, withdrawal of the §112 rejection is requested.

Claims 1 to 6 were rejected under 35 U.S.C. §102 over U.S. Patent No. 6,246,687 (Siu); and claims 7 to 97 were rejected under 35. U.S.C. §102 over U.S. Patent No. 6,515,965 (Hou). As shown above, Applicants have amended the independent claims to define the invention with greater clarity. In view of these amendments, withdrawal of the art rejection is respectfully requested.

Amended independent claim 1 is directed to a method of allocating bandwidth to data traffic flows for transfer through a network device. The method includes allocating bandwidth to a committed data traffic flow based on a guaranteed data transfer rate and a queue size of the

committed data traffic flow in the network device. The method also includes allocating bandwidth to uncommitted data traffic flows using a weighted maximum/minimum process. The weighted maximum/minimum process allocates bandwidth to the uncommitted data traffic flows in proportion to a weight associated with each uncommitted data traffic flow. The weight corresponds to a delay and an average rate requirement for each uncommitted data traffic flow.

The prior art reference Siu is not understood to disclose or suggest the foregoing features of claim 1. In particular, Siu does not teach a weighted maximum/minimum process that allocates bandwidth to the uncommitted data traffic flows in proportion to a weight associated with each uncommitted data traffic flow, where the weight corresponds to a delay and an average rate requirement for each uncommitted data traffic flow. Neither does Siu teach allocating bandwidth to uncommitted data traffic flows using this weighted maximum/minimum process, as in Applicants' amended claim.

Rather, Siu teaches a method for buffering cells in a switching network. The method assigns a guaranteed amount of buffer space per time interval (T) to each individual virtual connection (VC). Each individual VC is allocated an available buffer space in accordance to its guaranteed buffer space. Subsequently, the method allocates excess buffer space to each of the individual VCs in a round-robin fashion (*see* col. 2, lines 33-43; col. 4, lines 10-col. 5, lines 3).

Nowhere does Siu disclose or suggest "allocating bandwidth to uncommitted data traffic flows *using a weighted maximum/minimum process*, wherein the weighted maximum/minimum process allocates bandwidth to the uncommitted data traffic flows *in proportion to a weight associated with each uncommitted data traffic flow*, and the weight corresponding to a delay and

an average rate requirement for each uncommitted data traffic flow" as in Applicants' claim 1 (emphasis added). In this regard, Siu expressly states that during the second phase, the scheduler allocates excess buffer space to the individual VCs "in a round robin fashion [in order] to achieve fair allocation of the remaining buffer space" (col. 4, lines 56-58). A round-robin process refers to a method of allocation based on a looping fashion. The robin-robin process allocates an uniform amount of buffer space to an individual cell, before rotating this cell to the end of the list. As described in Siu, the round-robin scheduling continues to allocate in this uniform manner until all the excess buffer space has been allocated (*see* col. 4, lines 56- col. 5, lines 3).

Thus, Siu does not disclose or suggest allocating the bandwidth to uncommitted data traffic flows using a weighted maximum/minimum process. Although Siu describes a weight element (W_i) in its algorithms, this weight element (W_i) represents "the number of cells" waiting to be served. Each time a cell is served, the weight element (W_i) is decremented by one. In this regard, the weight element (W_i), described in Siu, functions as a counter (i.e. tracking the number of unserved cells). It does not serves as a basis for allocating the amount of bandwidth to uncommitted data traffic flows. For at least these reasons, Applicants submit that claim 1 is patentable over Siu.

Amended independent claim 42 is an apparatus claim that corresponds roughly to claim 1; and amended independent claim 89 is a computer program claim that corresponds roughly to claim 1. These claim are also believed to be patentable for at least the same reasons set forth with respect to claim 1.

Amended independent claim 7 is directed to a method of allocating bandwidth to data flows passing through a network device. Each of the data flows has an associated weight. The method includes increasing an amount of bandwidth to the data flows in proportion to the weights of the data flows until one port through the network device reaches a maximum value. The method also includes freezing the amounts of bandwidth allocated to the data flows in the one port. Furthermore, the method includes increasing the amount of bandwidth to all the remaining data flows passing through the network device in proportion to the weights of the remaining data flows.

The prior art reference Hou is not understood to disclose or suggest the foregoing features of claim 7. In particular, Hou does not teach "each of the data flows having an associated weight." Nor does Hou teach "increasing the amount of bandwidth to *all the remaining data flows* passing through the network device *in proportion to the weights of the remaining data flow*," as in Applicants' claim 7 (emphasis added).

Hou describes a method for allocating the capacity of a network router to the packet flow of a session. Each session has a minimum rate and a peak rate, which are used by an iterative process to determine the assignment of the available capacity. In this regard, the iterative process first increases the rate for a selected session, and then determines whether this increased rate equals the corresponding peak rate of that particular session. If so, the process sets the rate for that particular session. The method then repeats the iterative process for each session until the rates for all the sessions have been set (*see* col. 3, lines 7-26; col. 5, lines 1-53).

Nowhere does Hou disclose or suggest "increasing the amount of bandwidth to all the remaining data flows passing through the network device in proportion to the weights of the remaining data flows," as in Applicants' claim 7. Rather, Hou increases the amount of capacity for each session sequentially. As described in col. 5, lines 16-18, initially, Hou sorts all the sessions "in order of increasing minimum cell rates (MCRs)" to determine the order of performance for the iterative process. The iterative process selects the session with the smallest minimum cell rate (MCR) and increases the rate of this selected session by a pre-determined amount. The iterative process continues increasing the rate of this selected session until the corresponding peak rate is reached (*see* col. 3, lines 17-19). Once the rate of the selected session equals the corresponding peak rate, the iterative process sets the rate for that session and proceeds to the next session on the list (*see* col. 5, lines 39-41; Fig. 3, 309).

Thus, Hou does not teach "increasing the amount of bandwidth to *all the remaining data flows* passing through the network" but instead teaches increasing the rate for each session one at a time. Nor does Hou teach increasing the amount of bandwidth "in proportion to the weights of the remaining data flows." Rather, Hou describes increasing the rate by a pre-determined amount. This amount, subsequently, is tested to determine whether it equals the corresponding peak rate. For at least these reasons, Applicants submit that claim 7 is patentable over Hou.

Amended independent claim 48 is an apparatus claim that roughly corresponds to claim 7; and amended independent claim 90 is a computer program claim that corresponds roughly to claim 7. These claim are also believed to be patentable for at least the reasons set forth above with respect to claim 7.

Amended independent claim 11 is directed to a method of allocating bandwidth to data flows passing through a network device. The method includes allocating a predetermined amount of bandwidth to one or more of the data flows; and distributing remaining bandwidth to remaining data flows using a weighted maximum/minimum process. The weighted maximum/minimum process allocates bandwidth to remaining data flows in proportion to a weight associated with each remaining data flow. The weight corresponds to a delay and an average rate requirement for each remaining data flow.

As explained above with respect to claim 7, the Hou reference is not understood to disclose or to suggest "distributing the remaining bandwidth to remaining data flows using a weighted maximum/minimum process, wherein the weighted maximum/minimum process allocates bandwidth to remaining data flows in proportion to a weight associated with each remaining data flow, and the weight corresponding to a delay and an average rate requirement for each remaining data flow," as in Applicants' claim 11. Accordingly, claim 11 is also believed to be patentable over the art.

Amended independent claim 52 is an apparatus claim that roughly corresponds to claim 11; and amended independent claim 91 is a computer program claim that corresponds roughly to claim 11. These claim are also believed to be patentable for at least the reasons set forth above with respect to claim 11.

Amended independent claim 15 is directed to a method of allocating bandwidth to data flows passing through a network device. The method includes determining a character of the data flows; and allocating bandwidth to the data flows in accordance with the character of the

data flows. The character corresponds to a probability of the data flow in using the bandwidth. The bandwidth is allocated to data flows according to which data flows have a highest probability of using the bandwidth.

As explained above with respect to claim 7, the Hou reference is not understood to disclose or to suggest "determining a character of the data flows, the character corresponding to a probability of the data flow in using the bandwidth." Nor does Hou disclose allocating the bandwidth in accordance "to which data flows have a highest probability of using the bandwidth," as in Applicants' claim 15. For at least these reasons, Applicants submit that claim 15 is patentable over the art.

Amended independent claim 56 is an apparatus claim that roughly corresponds to claim 15; and independent claim 92 is a computer program claim that corresponds roughly to claim 15. These claim are also believed to be patentable for at least the reasons set forth above with respect to claim 15.

Amended independent claim 17 is directed to a method of allocating bandwidth to data flows passing through a network device. The method includes allocating the bandwidth using a weighted maximum/minimum process. The weighted maximum/minimum process allocates bandwidth uncommitted data traffic flows in proportion to a weight associated with each uncommitted data traffic flow. The weight corresponds to a delay and an average rate requirement for each uncommitted data traffic flow

As explained above with respect to claim 7, the Hou reference is not understood to disclose or to suggest "distributing remaining bandwidth to remaining data flows using a

weighted maximum/minimum process, wherein the weighted maximum/minimum process allocates bandwidth to remaining data flows in proportion to a weight associated with each remaining data flow, and the weight corresponding to a delay and an average rate requirement for each uncommitted data traffic flow" as in Applicants' claim 17. Accordingly, claim 17 is also believed to be patentable over the art.

Amended independent claim 58 is an apparatus claim that roughly corresponds to claim 17; and amended independent claim 93 is a computer program claim that corresponds roughly to claim 17. These claim are believed to be patentable for at least the reasons set forth above with respect to claim 17.

Amended independent claim 25 is directed to a method of allocating bandwidth to data flows through a network device. The method includes allocating bandwidth to the data flows using a weighted max/min process. The weighted maximum/minimum process allocates bandwidth to uncommitted data traffic flows in proportion to a weight associated with each uncommitted data traffic flow. The weight corresponds to a delay and an average rate requirement for each uncommitted data traffic flow. The method also includes an amount of bandwidth allocated to data flows passing through an input port of the network device is greater than an amount of data that can pass through the input port of the network device.

As explained above with respect to claim 7, the Hou reference is not understood to disclose or to suggest "allocating bandwidth to the data flows using a weighted max/min process, wherein the weighted maximum/minimum process allocates bandwidth to uncommitted data traffic flows in proportion to a weight associated with each uncommitted data traffic flow, and

the weight corresponding to a delay and an average rate requirement for each uncommitted data traffic flow," as in Applicants' claim 25. Accordingly, claim 25 is also believed to be patentable over the art.

Amended independent claim 66 is an apparatus claim that roughly corresponds to claim 25; and amended independent claim 94 is a computer program claim that corresponds roughly to claim 25. These claim are believed to be patentable for at least the reasons set forth above with respect to claim 25.

Amended independent claim 26 is directed to a method of allocating bandwidth to data flows passing through a network device. The method includes allocating bandwidth to data flows passing through input ports of the network device using a weighted max/min process. The weighted maximum/minimum process allocates bandwidth to uncommitted data traffic flows in proportion to a weight associated with each uncommitted data traffic flow. The weight corresponds to a delay and an average rate requirement for each uncommitted data traffic flow

As explained above with respect to claim 7, the Hou reference is not understood to disclose or to suggest "allocating bandwidth to data flows passing through input ports of the network device using a weighted max/min process, wherein the weighted maximum/minimum process allocates bandwidth to uncommitted data traffic flows in proportion to a weight associated with each uncommitted data traffic flow, and the weight corresponding to a delay and an average rate requirement for each uncommitted data traffic flow," as in Applicants' claim 26. Accordingly, claim 26 is also believed to be patentable over the art.

Amended independent claim 67 is an apparatus claim that roughly corresponds to claim 26; and amended independent claim 95 is a computer program claim that corresponds roughly to claim 26. These claim are also believed to be patentable for at least the reasons set forth above with respect to claim 26.

Amended independent claim 29 is directed to a method of allocating bandwidth to data flows through a network device. The method includes allocating bandwidth to the data flows passing through output ports of the network device using a weighted max/min process. The weighted maximum/minimum process allocates bandwidth to uncommitted data traffic flows in proportion to a weight associated with each uncommitted data traffic flow. The weight corresponding to a delay and an average rate requirement for each uncommitted data traffic flow.

As explained above with respect to claim 7, the Hou reference is not understood to disclose or to suggest "distributing remaining bandwidth to the data flows passing through output ports of the network device using a weighted max/min process, wherein the weighted maximum/minimum process allocates bandwidth to remaining data flows in proportion to a weight associated with each remaining data flow, and the weight corresponding to a delay and an average rate requirement for each uncommitted data traffic flow," as in Applicants' claim 29. Accordingly, claim 29 is also believed to be patentable over the art.

Amended independent claim 70 is an apparatus claim that roughly corresponds to claim 29; and amended independent claim 96 is a computer program claim that corresponds roughly to claim 29. These claim are also believed to be patentable for at least the reasons set forth above with respect to claim 29.

Independent claim 83 is directed to a method of transferring data traffic flows through a network device. The method includes transferring a committed data traffic flow through the network device using a guaranteed bandwidth; determining an amount of bandwidth that was used during a previous data traffic flow transfer; and allocating bandwidth in the network device to uncommitted data traffic flows based on the amount of bandwidth that was used during the previous data traffic flow transfer.

As explained above with respect to claim 7, the Hou reference is not understood to disclose or to suggest "allocating bandwidth in the network device to uncommitted data traffic flows *based on the amount of bandwidth that was used during the previous data traffic flow transfer,*" as in Applicants' claim 83 (emphasis added). Rather, Hou describes an iterative process that increases the rate of a selected session by a pre-determined amount. The iterative process continues by increasing the rate of the selected session until its rate equals its corresponding peak rate (*see* col. 3, lines 17-19). Nowhere does Hou describe basing the amount of allocated bandwidth on the amount of bandwidth that was "used during the previous data traffic flow transfer." For at least these reasons, Applicants submit that claim 83 is patentable over Hou.

Amended independent claim 85 is an apparatus claim that roughly corresponds to claim 83; and independent claim 97 is a computer program claim that corresponds roughly to claim 83. These claim are also believed to be patentable for at least the reasons set forth above with respect to claim 83.

Each of the dependent claims is also believed to define patentable features of the invention. Each dependent claim partakes of the novelty of its corresponding independent claim and, as such, has not been discussed specifically herein.

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement or concession of that rejection, issue or comment. In addition, because of the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed.

Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

In view of the foregoing amendments and remarks, Applicants respectfully submit that the application is in condition for allowance, and such action is respectfully requested at the Examiner's earliest convenience.

Applicants' undersigned attorney can be reached at the address shown below. All telephone calls should be directed to the undersigned at (617) 368-2158.

Please apply any fees or credits due in this case, which are not already covered by check, to Deposit Account 06-1050, referencing Attorney Docket No. 06269-020001.

Respectfully submitted,

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